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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/868,929

07/16/2001

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12/19/2002

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EXAMINER

LE, DANG D

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/868,929

Applicant(s)

SHIKAYAMA ET AL.

Examiner

Dang D Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: . |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "axial multiple angle NX" in claims 4 and 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: There are no descriptions for Figures 6-8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 is indefinite because "X" is not defined. Claim 5 is also indefinite because "X" and "N" are not defined. It is neither clear what "the eddies" and "2N eddies" are in claim 5.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Golker et al. in view of Ryuichiro et al. (JP 8136211).

Regarding claim 1, Golker et al. show a resolver (Figure 1) including a disk-shaped rotor (8) and two disk-shaped stators (15, 4) between which said rotor is placed with air gaps in the axial direction thereof wherein said rotor is such that a rotor side sheet coil is attached to one side of a disk-shaped soft magnetic material (8) on which are formed a resolver excitation phase pattern (13), and a stator side sheet coil having a resolver detection phase pattern (11) formed on a disk-shaped soft magnetic material is attached to said stator opposed to said resolver excitation phase pattern.

Golker et al. do not show a rotor side sheet coil attached to one side of a disk-shaped soft magnetic material on which are formed a secondary-side pattern of a rotary transformer and a stator side sheet coil having a rotary transformer primary side pattern formed on a disk-shaped soft magnetic material attached to one of said stators opposed to said rotary transformer secondary pattern. The secondary and primary transformers of Golker et al. are formed of windings (16,18) wound in cores (15, 17), respectively.

Ryuichiro et al. show the secondary and primary transformers formed of sheet coils (Figures 3 and 4) for the purpose of reducing cost.

Since Golker et al. and Ryuichiro et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the secondary and primary transformers of sheet coils as taught by Ryuichiro et al. for the purpose discussed above.

8. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golker et al. and Ryuichiro et al. as applied to claim 1 above, and further in view of Van Loenen et al.

Regarding claim 2, the resolver of Golker et al. modified by Ryuichiro et al. includes all of the limitations of the claimed invention except for the rotor side sheet coil being formed of a single sheet composed of a disk having said resolver excitation phase pattern formed, a disk having said rotary transformer secondary side pattern formed,

and a linear portion having a cross-over line that connects said resolver excitation phase pattern and said rotary transformer secondary side pattern to each other.

Van Loenen et al. show the use of a single sheet composed of a disk having two patterns formed (Figure 3A) and a linear portion (52 a) having a cross-over line that connects said patterns to each other for the purpose of reducing cost.

Since Golker et al., Ryuichiro et al. and Van Loenen et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the rotor side sheet coil of a single sheet composed of a disk having said resolver excitation phase pattern formed, a disk having said rotary transformer secondary side pattern formed, and a linear portion having a cross-over line that connects said resolver excitation phase pattern and said rotary transformer secondary side pattern to each other as taught by Loenen et al. for the purpose discussed above.

Regarding claim 3, it is noted that if combined, Golker et al. and Van Loenen et al. also show said stator side sheet coil being formed of a single sheet composed of a disk having said resolver detection phase pattern formed, a disk having said rotary transformer primary side pattern formed, and a linear portion that links the corresponding two disks with each other.

Regarding claim 4, it is noted that Ryuichiro et al. also show said rotary transformer secondary side pattern formed on both sides of the disk according to the

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invention is a pattern eddying from outside to inside, and both the patterns are connected to each other in series, and said resolver excitation phase pattern that is formed at both sides of the disk is a pattern eddying by $2N$ times in the circumferential direction where N is a natural number, and the center of the eddy on the surface side is disposed at the same position of the eddy on the rear side in the circumferential direction, and $4N$ eddies are connected to each other in series, wherein the axial multiple angle is NX .

Regarding claim 5, it is noted that Van Loenen et al. and Ryuichiro et al. also show said rotary transformer primary side pattern being formed on both sides of the disk, and both patterns eddying from outside to inside are connected to each other in series, and said resolver detection phase pattern is formed on both sides of the disk, and one side of which is an "a" phase (U' , V' , W') and the other of which is "b" phase (U , V , W), wherein $2N$ patterns eddying in the circumferential direction are disposed, and the center positions of the eddies of the "a" phase and "b" phase slip by $90/N$ degrees from each other in the circumferential direction, and $2N$ eddies are connected to each other in series to cause the axial multiple angle to become NX .

Regarding claim 6, it is noted that Ryuichiro et al. also show one of either the outer diameter of said rotary transformer secondary side pattern or that of said rotary transformer primary side pattern is made larger than the other thereof (Figures 3-6).

Regarding claim 7, it is noted that Ryuichiro et al. do not show the radius $r2$ of the extremely outer conductor of said rotary transformer secondary side pattern and radius $r1$, of the extremely outer conductor of said rotary transformer primary side

pattern is established so as $0 < r_2 - r_1 \leq 4L_2$ or $0 < r_1 - r_2 \leq 4L_1$, where the pattern pitch of the rotary transformer secondary side pattern is L_2 and the pattern pitch of the rotary transformer primary side pattern is L_1 .

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to establish the radius r_2 of the extremely outer conductor of said rotary transformer secondary side pattern and radius r_1 of the extremely outer conductor of said rotary transformer primary side pattern so as $0 < r_2 - r_1 \leq 4L_2$ or $0 < r_1 - r_2 \leq 4L_1$, where the pattern pitch of the rotary transformer secondary side pattern is L_2 and the pattern pitch of the rotary transformer primary side pattern is L_1 , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 8, it is noted that Ryuichiro et al. also show the outer diameter of said resolver excitation phase pattern made larger than the outer diameter of the resolver detection phase pattern while the inner diameter of the resolver excitation phase pattern made smaller than the inner diameter of the resolver detection phase pattern, or the outer diameter of the above-described detection phase pattern made larger than the outer diameter of the above-described excitation phase pattern while the inner diameter of the detection phase pattern made smaller than the inner diameter of the excitation phase pattern.

Regarding claim 9, it is noted that Ryuichiro et al. do not show the pattern pitch of the resolver detection phase pattern being L_t , and the pattern pitch of the solver

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detection phase pattern being L_a , the radius R_{t0} of the extremely outer conductor of the resolver excitation phase pattern and the radius ra_0 of the extremely outer conductor of the rotary transformer primary side pattern, or the radius R_{ti} of the extremely inner conductor of the resolver excitation phase pattern and the radius R_{ai} of the extremely inner conductor of the rotary transformer primary side pattern established so as to become $0 < Ra_0 - R_{t0} \leq 4L_a$ and $0 < R_{ti} - R_{ai} \leq 4L_a$ or $0 < R_{t0} - Ra_0 \leq 4L_t$ and $0 < R_{ai} - R_{ti} \leq 4L_t$.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set the pattern pitch of the resolver detection phase pattern as L_t , and the pattern pitch of the solver detection phase pattern as L_a , and to establish the radius R_{t0} of the extremely outer conductor of the resolver excitation phase pattern and the radius ra_0 of the extremely outer conductor of the rotary transformer primary side pattern, or the radius R_{ti} of the extremely inner conductor of the resolver excitation phase pattern and the radius R_{ai} of the extremely inner conductor of the rotary transformer primary side pattern so as to become $0 < Ra_0 - R_{t0} \leq 4L_a$ and $0 < R_{ti} - R_{ai} \leq 4L_a$ or $0 < R_{t0} - Ra_0 \leq 4L_t$ and $0 < R_{ai} - R_{ti} \leq 4L_t$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re* Aller, 105 USPQ 233.

Information on How to Contact USPTO

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (703) 305-0156.

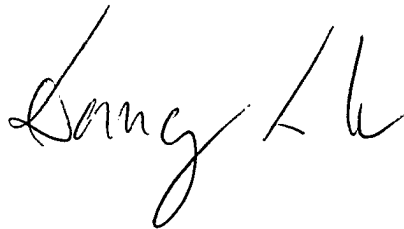
The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

DDL
December 14, 2002

DL

A handwritten signature in cursive script, appearing to read "Dang D Le".